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RESEARCH PROJECT INITIATION

Date: June 11, 1975

Project Title: Twenty-Second International Field Emission Symposium

Project No: E-19-639

Principal Investigator: Helen E. Grenga

Sponsor: National Science Foundation

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Sponsor Contact Person (s):

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Assigned to: Chemical Engineering

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SPONSORED PROJECT TERMINATION

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Date: March 13, 1976

Project Title: Twenty-Second International Field Emission Symposium

Project No: E-19-639

NSF Grant

Project Director: Dr. Helen E. Grenga

Sponsor: National Science Foundation

Effective Termination Date: 10/31/75

Clearance of Accounting Charges: 1/31/76

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- __ Final Invoice and Closing Documents
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- __ Final Report of Inventions
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E-19-639
Conference Report

Conference Report

22nd International Field Emission Symposium

Helen E. Grenga
Georgia Institute of Technology

National Science Foundation
Grant DMR 75-15399

The 22nd International Field Emission Symposium was held at Georgia Tech on August 25-29, 1975. It was a very successful scientific meeting, the highlights of which are briefly given below. The entire program is given in the enclosed Abstract book, which is traditionally the only publication resulting from these annual Symposia.

The support provided by the National Science Foundation helped insure a good international attendance of researchers and graduate students. A list of attendees is enclosed with this report, and a statistical summary at the end of this report includes a list of those supported with NSF funds.

Scientific Highlights

The summary below is a general overview of the symposium; for specific applications and results, reference is made to the accompanying Abstract Book.

One of the most unusual aspects of this Symposium as well as that of previous Field Emission Symposia is the interaction between researchers who are interested in advancing the techniques and those who are interested in applying these techniques to solving scientific problems. This interaction continues to play an important role in scientific advancements in areas utilizing these techniques.

At this symposium seven presentations by outstanding researchers were invited to review and project applications of these techniques in various areas. They included the following:

E. W. Muller - Imaging in Field-ion Microscopy

L. W. Swanson - Characteristics and Applications of Field Emission Sources

A. V. Crewe - Applications of Field Emitters to High Resolution Scanning Microscopy

B. Ralph - Metallurgical Applications of the Field-ion Microscope

J. A. Panitz - Surface Characterization by Single-Atom Mass Spectroscopies

D. N. Seidman - The Study of Point Defects in Irradiated or Quenched Metals by Quantitative Atom-Probe and Field-ion Microscopy

P. J. Turner - Metallurgical Applications of the Atom-Probe Field-ion Microsco

It was clear from these papers, as well as others at the symposium, that the applications of these techniques are rapidly broadening and that concentration in several areas is centering on obtaining more quantitative information than previous available. This is true in surface studies, particularly surface diffusion studies and atom-probe surface characterization, as well as in metallurgical applications, for example studies on defects and phase transformations. A number of pitfalls, however, still exist; and additional advances are required in theory as well as in techniques.

The atom-probe which may represent the ultimate in identifying single surface atoms and detecting single atomic events at the surface, has advanced rapidly in so applications recently, but a number of problems still hinder its broader use. Relatively few laboratories can yet afford the time and expense in setting up and maintaining the equipment. This has been partially overcome by advances and simplifications in the technique. In the near future, as the theory continues to develop more solidly, and its usefulness is further demonstrated, we should see a much broader spectum of applications for this technique.

Statistical Summary

Number of papers presented: 71 (see Abstract Book)

Number of persons registered: 81 (see Roster)

USA	- 53	France	- 2
England	- 8	Japan	- 3
Sweden	- 2	Germany	- 3
Netherlands	- 2	Austria	- 1
Poland	- 2	India	- 1
Yugoslavia	- 1	N. Irland	- 1
Israel	- 1	Canada	- 1

Persons supported by the National Science Foundation:

Michael Martinka (U.S.A)	$50
Dr. Richard Wagner (U.S.A.)	$60
Hans-Olof Andren (Sweden)	$70
J. M. Bermond (France)	$70
Dr. Ryszard Blaszczyszyn (Poland)	$70
Dr. Ference Kormendi (Yugoslavia)	$70
Dr. Sakae Ishii (Japan)	$70
Dr. Ryszard Meclewski (Poland)	$70
Dr. Werner A. Schmidt (Germany)	$70
Robert Waugh (England)	$70
Prof. Keiji Yada (Japan)	$70
Prof. Yuzo Yashiro (Japan)	$70
Dr. Thomas H. Hall (U.S.A)	$60
Robert Billington (U.S.A.)	$50
Paul L. Cowan (U.S.A.)	$50
Harvill Eaton (U.S.A.)	$50
Gary Kellogg (U.S.A.)	$50
S. V. Krishnaswamy (U.S.A.)	$60
Cheung-Wan Leung (U.S.A.)	$50
Reza Saadat (U.S.A.)	$50
Dr. Marek Wilf (Canada)	$60
Jiann-Ruey Chen (U.S.A.)	$30
R. Ralph (England)	$70
Dr. John A. Panitz (U.S.A.)	$60
Dr. David N. Seidman (U.S.A.)	$60
Dr. Lynwood Swanson (U.S.A)	$60
Dr. Patrick Turner (England)	$100
Dr. Richard Forbes (England)	$70
Dr. David Smith (England)	$70
Dr. Erich Krautz (Austria)	$70
Dr. Hans Norden (Sweden)	$70
Cliff Stevenson (N. Ireland)	$50

22nd INTERNATIONAL FIELD EMISSION SYMPOSIUM

August 25-29, 1975

Georgia Institute of Technology

Atlanta, Georgia

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